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SCIENCE

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AMERICAN BOTANY AND THE GREAT WAR

THAT botany, the traditional *scientia amabilis,* should have a place in the present world war seems almost a contradiction in terms. Yet so far are we from the days when war was the concern of professional soldiers only, that one of the earliest announced requests of the British war commission was for regiments of foresters, who are first of all botanists, for service in the forests of France.

That the activities of all professional botanists should, moreover, be profoundly influenced by the war was inevitable. Botany like other sciences is international. Before the war Germany held a prominent and unique place in the botanical world. A number of American students of botany were trained in her laboratories, and although within the last decade the emigration of American students to Germany had slackened, it was the war which effectually stopped the current.

Germany held moreover an almost complete monopoly of the publication of abstracts of botanical papers. Botanists had come to take it as a matter of course that botanical abstracts would appear in German publications, and two at least of these abstract journals had attained world-wide circulation and prestige. These abstract journals are, of course, no longer available in America, if indeed they are being published. It is natural that in this particular field, now left vacant, American botanists should begin to extend their activities and it is gratifying to note that, at their last annual meeting (January, 1918), the members of the various American botanical societies inaugurated the publication of such a journal under editorship which guarantees its success.

In incidental, and somewhat unexpected, ways the war has influenced botanical studies. The shortage of potash has stimulated the study of kelps, and the culture of these and other marine algæ; while the increased consumption and rising price of coal has led to the reopening of at least one abandoned mine which has yielded fossil plants of great scientific interest in the past and will be closely watched by paleobotanists this summer. The recently recognized value of certain species of sphagnum moss (especially *Sphagnum papillosum* and *S. palustre*) as a substitute for absorbent cotton for use in surgical dressings has enabled the very few botanists who are familiar with this rather difficult genus to render important service to the Red Cross by exploring the sphagnum resources of the country and by advising local Red Cross chapters in their efforts to locate new sources of supply.

Undoubtedly the most striking effect of the great war on American botanists has been to direct their attention more generally than ever before to problems of plant pathology. The food situation, accompanied by the educational campaign of the Food Administration and Department of Agriculture, directed popular attention to the basic fact that humanity is, in the last analysis, directly dependent on green plants for food. Statements that we "must save wheat for our allies" lent new interest to the fact that stinking smut of wheat annually costs the United States twenty-two million bushels. Urgent advice that we must use perishable fruits and vegetables to save more concentrated foods for the armies in France called public attention sharply to the fact that fresh fruits and vegetables can not easily be shipped great distances, that they are in truth highly perishable; and finally to the tragic fact that large amounts are annually lost in transit and on the market.

With this increased popular interest went a renewed realization on the part of botanists themselves of the fundamental importance of their work and of their own responsibility in such matters. They knew that stinking smut was preventable and the means of its prevention. They realized the immediate necessity, military necessity even, that it be prevented. With state and federal agencies calling attention to the need for increased utilization of fruits and vegetables came the realization that five to ten per cent. of our eighty million dollar apple crop is destroyed by diseases the control of which is well understood and aroused the determination that they should in fact be controlled.

The case of losses which occur on the market was not so simple. The methods of control of plant diseases which cause losses of fruits and vegetables in transit have been worked out in a few instances, whereas about others very little is known. The obligation, however, was equally apparent, so far as methods of control were known they must be applied, where none were known they must be found.

With such a task before them it is not surprising that American botanists have organized as never before and as a result this summer is seeing a campaign for the control of plant diseases never approached in this country. With this there is being carried on an increased amount of research on fundamental scientific questions of significance in the control of plant disease.

This increased usefulness is being brought about by better organization of the men already engaged in the work and by much outside assistance from botanists who are not, professionally, plant pathologists. Both these changes would, indeed, have been necessary in order to keep up even the normal activities in plant pathology, for the number of workers in this line, as in all lines, has been reduced by the needs of the army and navy. The younger men and in particular the graduate students preparing for work in plant pathology have enlisted in large numbers.

The organization of American botanists for greater service in the study and control of plant diseases is under the immediate direction of the War Board of American Pathologists, a representative committee appointed by the American Phytopathological Society, at its annual meeting, January, 1918. The work which this committee has already accomplished is too varied to be detailed. Three phases of its activity will sufficiently illustrate the scope and methods of its work. These are the man power census, the extension work, and the assistance of research.

A reorganization of man power, if much was to be accomplished, was rendered absolutely necessary by the inroads due to enlistment for military service. The first step in this direction was taken by the man power census. A brief questionnaire was sent to every botanist in America, who could be reached, and on this card each man was requested to indicate his training, degree of availability and willingness to take up emergency work in plant pathology. The replies have been most gratifying in number and tone. Teachers of botany and investigators in other fields have in considerable numbers indicated a willingness to lay aside temporarily their own investigations, investigations usually of great importance to the progress of botanical science, and take up work on the control of plant diseases.

The aim of the extension work of the committee is to make available everywhere in America information now available anywhere in America. Pathologists in various states were asked to contribute any information they might have, published or unpublished, which might be of service in other sections. Responses to this request also have been prompt and enthusiastic. Pathologists all over the country have placed in the hands of the committee for general distribution information which they have acquired in their own work and which seemed likely to be useful to other workers. They have done this frequently without waiting to insure credit to themselves by prior publication. Instead of safety first they have placed service first.

In research the effort has been to call attention to those problems which were of most pressing importance and to coordinate the work of investigators in different regions. Much has been accomplished here in so arranging work that the efforts of one investigator should supplement rather than duplicate those of his neighbor.

The results of these lines of effort can not fail to be of great service. Undoubtedly the greatest immediate gain will come from the extension work, from the distribution of information to the plant pathologists of every state in the union and the further distribution of this information through the county agents and the farm demonstrators to the actual producers. It is highly probable, however, that the greatest ultimate good to plant pathology as a science and to the nation will come from the temporary enlistment of a large number of botanists from other lines. This increase is not a gain in numbers merely but a gain in different technical training, different methods of work, new points of view. So close are the interrelations of the natural sciences that striking contributions to a science are frequently made by a newcomer in the field who has been well trained in another not too closely related field. Thus it is only natural to expect that from the present mobilization of botanists of all kinds in plant pathology will come striking and valuable contributions to that science.

Neil E. Stevens
Bureau of Plant Industry,
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A SURVEY OF HIGH-SCHOOL CHEMISTRY IN PENNSYLVANIA

For the purpose of establishing a relationship between high-school and college chemistry, the writer sent the following information blank to the 971 high schools of Pennsylvania, following the original communication by a second request.

Name of high or preparatory school ....
Location .... St., City ...... State ......
Name of officer making this report ....
Official Title ....

1. Do you require a three- or four-year course for graduation: .... year.
2. Do you give a course in general science?......
   In which year is it taught? ....
3. Do you give a course in physics?............
   In which year is it taught? ....

*4. Do you offer a course in general inorganic chemistry? .... In which year is it taught? ...... How many weeks? ......
   How many pupils take the course? ....

5. How many lecture periods per week? ....
   Length of period? ....
   How many recitation periods per week?....
   Length of period? ....
   How many laboratory periods per week?....

* If you offer more than one couse, furnish statistics for the one considered your college preparatory course and mention the other under 14.